

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicants: J. Boer et al.

Case: 6-2-2-5

Serial No.: 10/621,862

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Art Unit: 2611

Examiner: Leila Malek

Title: Signal Quality Estimation in a
Wireless Communication System

REPLY BRIEF

Commissioner for Patents
P.O. Box 1450
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Sir:

The remarks which follow are submitted in response to the Examiner's Answer dated October 16, 2008, (hereinafter "the Answer") in the above-identified application. The arguments presented by Appellants in the corresponding Appeal Brief are hereby incorporated by reference herein.

In Section 10(B) of the Answer, on pages 30-40, the Examiner responds to various arguments raised by Appellants in the Appeal Brief.

REMARKSClaims 1, 5, 12-14, 25, 33 and 38 (pages 30-34 of the Answer)

In a response dated December 13, 2007, Appellants submitted a Declaration of Prior Invention in accordance with 37 CFR 1.131. The Declaration and the exhibits attached thereto evidence the actual reduction to practice of an invention falling within the present independent claims at least as early as March 12, 2001.

On page 30 of the Answer, the Examiner contends that “[s]ince the Applicants failed to submit [] a petition under in compliance with rule 1.47, the Declaration has been considered but is ineffective to overcome the references used in the previous office action.” Appellants respectfully submit that this contention is inconsistent with MPEP 715.04(I), which states that

The following parties may make an affidavit or declaration under 37 CFR 1.131:

- (A) All the inventors of the subject matter claimed.
- (B) An affidavit or declaration by less than all named inventors of an application is accepted where it is shown that less than all named inventors of an application invented the subject matter of the claim or claims under rejection. . . .
- (C) If a petition under 37 CFR 1.47 was granted or the application was accepted under 37 CFR 1.42 or 1.43, the affidavit or declaration may be signed by the 37 CFR 1.47 applicant or the legal representative, where appropriate.
- (D) The assignee or other party in interest when it is not possible to produce the affidavit or declaration of the inventor. *Ex parte Foster*, 1903 C.D. 213, 105 O.G. 261 (Comm'r Pat. 1903).

Accordingly, MPEP 715.04(I) clearly indicates that “when it is not possible to produce the affidavit or declaration of [an] inventor,” one may either file a petition under 37 CFR 1.47, as provided in MPEP 715.04(I)(C), or one may rely on *Ex parte Foster*, as provided in MPEP 715.04(I)(D).

In the present case, Appellants have chosen to invoke MPEP 715.04(I)(D), rather than MPEP 715.04(I)(C). Appellants are not seeking to invoke 37 CFR 1.47, but rather are relying on *Ex parte Foster*, 1903 C.D. 213, 214, 105 O.G. 261 (Comm'r Pat. 1903) (“The rule says that the inventor’s affidavit will be sufficient; but it does not say that the fact may not be established in some other way. . . . The essential fact is priority of invention, and the Office may accept any satisfactory evidence of that fact. . . . Where the testimony of the inventor cannot be obtained, priority may in some cases be proved without his testimony”). In other words, *Ex parte Foster*

allows priority of invention to be shown by “any satisfactory evidence,” even without any inventor testimony whatsoever.

In the present case, Appellants respectfully submit that the Declaration signed by three of the four inventors, including the inventor who prepared the evidence relied upon in the Declaration, is sufficient to show actual reduction to practice even without the testimony of the fourth inventor, who could not be reached.

On page 31 of the Answer, the Examiner contends that Appellants have failed to submit documentary evidence that diligent efforts were made to reach the fourth inventor, Ra’anan Gil. On June 5, 2008, Appellants submitted an Attorney Affidavit and related exhibits which show that, despite diligent efforts on the part of Appellants and their attorneys, the fourth inventor was unable to be reached.

The Attorney Affidavit was prepared by, and signed by, David E. Shifren, Reg. No. 59,329, who is an attorney of record in the present application. Mr. Shifren attested that he sent an electronic mail message to the inventors for whom Mr. Shifren had current contact information requesting current contact information for inventor Ra’anan Gil. Mr. Shifren received an electronic mail message including current contact information for Mr. Gil. Mr. Shifren sent five subsequent electronic mail communications to Mr. Gil. Despite there being no indication that these electronic mail messages were not received by Mr. Gil (such as, for example, an electronic mail delivery failure notification), Mr. Shifren never received any response from Mr. Gil.

On pages 31-32 of the Answer, the Examiner argues that Exhibit 1 of the Declaration fails to provide support for “generating the signal quality estimate by measuring a difference between one or more constellation points associated with the at least one reference field and one or more corresponding points associated with the at least one field in the receiving signal.”

Appellants initially note that this limitation is not recited in any of the independent claims, but rather is recited only in dependent claims 2, 19 and 26. Also, MPEP 715.02 states:

The 37 CFR 1.131 affidavit or declaration must establish possession of either the whole invention claimed or something falling within the claim . . . in the sense that the claim as a whole reads on it. *In re Tanczyn*, 347 F.2d 830, 146 USPQ 298 (CCPA 1965) . . .

Further, a 37 CFR 1.131 affidavit is not insufficient merely because it does not

show the identical disclosure of the reference(s) or the identical subject matter involved in the activity relied upon. If the affidavit contains facts showing a completion of the invention commensurate with the extent of the invention as claimed is shown in the reference or activity, the affidavit or declaration is sufficient, whether or not it is a showing of the identical disclosure of the reference or the identical subject matter involved in the activity. See *In re Wakefield*, 422 F.2d 897, 164 USPQ 636 (CCPA 1970).

Moreover, this feature is explicitly described in Exhibit 1 of the Declaration at page 2, second paragraph (“The idea behind the SQ indicator is measuring the Euclidean distance between the reference constellation points and the received constellation points. The closer the received constellation points are to the received constellation points the better SQ.”)

On page 32 of the Answer, the Examiner contends that “since in the Exhibits submitted by the Appellants, the definition of ‘reference’ constellation point is not clear, Examiner is not certain if the ‘reference constellation point’ disclosed in Appellants’ exhibit is the same as the reference constellation point cited by the Appellants in claims of the instant Application. Therefore, in view of lack of any description for ‘reference’ constellation points, Examiner respectfully disagrees with the Appellants’ argument that there is support for this limitation in the submitted exhibits.”

Appellants respectfully submit that page 2, second and third paragraphs, of Exhibit 1 of the Declaration describes an embodiment similar to an illustrative embodiment described in the specification at, for example, page 7, lines 13-18, and page 9, lines 5-13.

More particularly, Exhibit 1 at page 2, second and third paragraphs, states that:

The idea behind the SQ indicator is measuring the Euclidean distance between the reference constellation points and the received constellation points. The closer the received constellation points are to the received constellation points the better SQ. For rate independent processing and for the sake of simplicity only the SIGNAL-field of a message is used for the SQ measurement. The SIGNAL-field consists of 24 bits that are rate $\frac{1}{2}$ coded and BPSK modulated, resulting in 48 samples located at +1 or -1....

[An] implementation first scales the incoming samples according to the amplitude estimate of the channel and the power droop to position them around the reference points. The scaled samples are then compared with the reference samples of +1 and -1. The magnitude of the resulting error is then computed and

only the path that has the smallest magnitude is forwarded. This leads to 48 magnitude values, summing them results in a number representing the SD.

Compare the preceding portion of Exhibit 1 with the illustrative embodiment described in the specification at, for example, page 7, lines 13-18, and page 9, lines 5-13:

In accordance with one embodiment of the present invention, the fixed-modulated and/or encoded portion of a given received packet (e.g., the received SIGNAL field in an IEEE 802.11 packet) is compared with a reference field representing the original modulation and encoding scheme that has been corrected for channel conditions (i.e., channel-corrected modulation scheme). The signal quality estimation may then be derived as a function of a difference between the received field and the reference field. . . .

The exemplary signal quality estimation methodology preferably involves generating a reference SIGNAL field by first demodulating and decoding the received SIGNAL field, followed by encoding and modulating the SIGNAL field and applying a channel estimate. The resulting reference SIGNAL field excludes contribution such as, for example, channel noise and impairments associated with the channel, transmitter and/or receiver. The received SIGNAL field is then compared with the reference SIGNAL field. This will result in 48 complex values, one value for each of the corresponding samples in the SIGNAL field. Taking the magnitude of the 48 complex values and summing them together results in a signal quality estimation for that specific packet.

In view of the foregoing, Appellants maintain that the Declaration of Prior Invention filed December 13, 2007, and the Attorney Affidavit filed June 5, 2008, are effective to remove Tzannes as §102(e) prior art and thus to overcome the present rejection.

On page 34, the Examiner contends that “it is extremely well known in the art that channel estimation signal must be generated at the receiver by using the received signal. Therefore, it is not a valid argument that the channel estimation signal can be generated without using the received signal.”

With regard to the Examiner’s allegation that a channel estimation signal “*must* be generated at the receiver by using the received signal” (emphasis added), an allegation which is incorrect, Appellants respectfully note that an assessment of basic knowledge and common sense that is not based on any evidence in the record lacks “substantial evidence” support and may not form the basis for a rejection. *In re Zurko*, 258 F.3d 1379, 1385, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). Rather, the Examiner must provide specific factual findings predicated on sound technical and scientific reasoning to support his or her conclusion of common knowledge. See,

e.g., *In re Soli*, 317 F.2d 941, 946, 137 USPQ 797, 801 (CCPA 1963); *In re Chevenard*, 139 F.2d 711, 713, 60 USPQ 239, 241 (CCPA 1943). See also *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original) (“In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.”)

On page 34 of the Answer, the Examiner argues that Sano discloses generating a signal quality estimate as a function of the at least one field in the received signal and the generated at least one reference field. Specifically, the Examiner argues that “Sano in Fig. 1 shows that a signal quality estimate (see the output of SIR calculators) has been generated as a function of the at least one field in the received signal (e.g. the data field or the pilot field) (see the delay version of the received signal) and the generated at least one reference field (see the outputs of fading compensating sections).”

Appellants respectfully submit that FIG. 1 of Sano shows that SIR calculators 2 each receive one input, which in turn is based on an output of fading compensating sections 1, which in turn each receive the output of delay unit 307 (i.e., “the delay version of the received signal”). In other words, rather than teaching an embodiment wherein the output of SIR calculators is generated as a function of the delayed version of the received signal and the outputs of fading compensating sections, FIG. 1 shows an embodiment in which the output of SIR calculators is generated as a function of the outputs of fading compensating sections, which are in turn a function of a delayed version of the received signal and additional input(s).

Thus, FIG. 1 of Sano fails to even disclose the arrangement which the Examiner contends meets the limitation at issue, much less to meet the limitation at issue.

Claims 16 and 17 (pages 34-35 of the Answer)

Appellants maintain that the Declaration of Prior Invention filed December 13, 2007, and the Attorney Affidavit filed June 5, 2008, are effective to remove Tzannes from consideration and thus to overcome the present rejection.

On page 35 of the Answer, the Examiner asserts that “Sano teaches measuring at least one characteristic corresponding to the at least one field in the received signal (i.e. measuring the

[SIR]); and generating a signal quality estimate (see the outputs of the SIR blocks) as a function of the at least one field in the received signal (i.e., the delayed version of the field) and the generated at least one reference field (see the outputs of the fading compensation units, and column 6, lines 48-58)."

Appellants respectfully submit that the Examiner has conceded in the above-quoted statement that Sano at column 6, lines 48-58, teaches generating a signal quality estimate as a function of a field in the received signal, rather than the limitation of claim 16 directed to generating a signal quality estimate as a function of at least a characteristic corresponding to a field in the received signal. Appellants note that this is the exact argument advanced by Appellants in the Appeal Brief at page 17, last paragraph.

Claims 2-4, 6, 26, 27 and 29 (page 35 of the Answer)

Dependent claims 2-4, 6, 26, 27 and 29 are believed to be patentable at least by virtue of their respective dependencies from independent claims 1 and 25, which are believed patentable for at least the reasons identified above.

Furthermore, Appellants maintain that the Declaration of Prior Invention filed December 13, 2007, and the Attorney Affidavit filed June 5, 2008, are effective to remove Mobin, as well as Tzannes, from consideration, and thus to overcome the present rejection.

Claim 34 (pages 35-36 of the Answer)

Appellants maintain that the Declaration of Prior Invention filed December 13, 2007, and the Attorney Affidavit filed June 5, 2008, are effective to remove Tzannes and Mobin from consideration, and thus to overcome the present rejection.

On page 39, the Examiner contends that "it is extremely well known in the art that channel estimation signal must be generated at the receiver by using the received signal. Therefore, it is not a valid argument that the channel estimation signal can be generated without using the received signal."

Aside from the fact that the Examiner's allegation that a channel estimation signal quality "must be generated at the receiver by using the received signal" (emphasis added) is incorrect, Appellants respectfully note that an assessment of basic knowledge and common sense that is not

based on any evidence in the record lacks “substantial evidence” support and may not form the basis for a rejection. *In re Zurko*, 258 F.3d 1379, 1385, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). Rather, the Examiner must provide specific factual findings predicated on sound technical and scientific reasoning to support his or her conclusion of common knowledge. See, e.g., *In re Soli*, 317 F.2d 941, 946, 137 USPQ 797, 801 (CCPA 1963); *In re Chevenard*, 139 F.2d 711, 713, 60 USPQ 239, 241 (CCPA 1943). See also *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original) (“In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.”)

In the Appeal Brief at page 19, last paragraph, Appellants argued that Mobin fails to teach or suggest the limitation of claim 34 directed to generating a signal quality estimate as a function of a difference between the at least one reference field and the at least one field in the received signal. Specifically, even if the branch metric taught by Mobin could be considered analogous to the recited difference, Mobin fails to teach or suggest generating a signal quality estimate as a function of the branch metric.

On page 36 of the Answer, the Examiner argues that Mobin discloses “generating a signal quality estimate as a function of the branch metric” because “Mobin in column 10, lines 19-21, discloses that an estimate of the received signal for each candidate state is employed in a process referred to, in this context, as branch metric processing.”

Appellants respectfully submit that, even if the cited portion of Mobin did, in fact, disclose “that an estimate of the received signal for each candidate state is employed in a process referred to, in this context, as branch metric processing,” such teachings would indicate that, rather than generating a signal quality estimate as a function of the branch metric, Mobin instead generates a branch metric as a function of a signal quality estimate. This approach is entirely opposite to that recited in claim 34.

Claims 7-9, 30 and 31 (page 37 of the Answer)

Dependent claims 7-9, 30 and 31 believed to be patentable at least by virtue of their respective dependencies from independent claims 1 and 25, which are believed patentable for at

least the reasons identified above.

Moreover, as noted above, Appellants maintain that the Declaration of Prior Invention filed December 13, 2007, and the Attorney Affidavit filed June 5, 2008, are effective to remove Tzannes and Mobin from consideration, and are thus sufficient to overcome the present rejection.

Claims 18-20 and 38 (page 37 of the Answer)

Appellants maintain that the Declaration of Prior Invention filed December 13, 2007, and the Attorney Affidavit filed June 5, 2008, are effective to remove Tzannes and Mobin from consideration, and thus to overcome the present rejection.

On page 37 of the Answer, the Examiner indicates that “Appellants’ argument, cited on page 21, lines 1-11, is the same as Appellants [sic] argument for claims 1, 25 and 38. Therefore, Examiner’s response to this argument is the same as cited above. . . . Appellants’ argument, cited on page 21, lines 1-11, is the same as Appellants’ argument for claim 34. Therefore, Examiner’s response to this argument is the same as cited above.” Appellants respectfully reply to the Examiner’s responses by presenting arguments similar to those heretofore presented.

Claims 10 and 32 (page 37 of the Answer)

Dependent claims 10 and 32 believed to be patentable at least by virtue of their respective dependencies from independent claims 1 and 25, which are believed to be patentable for at least the reasons identified above.

Furthermore, Appellants maintain that the Declaration of Prior Invention filed December 13, 2007, and the Attorney Affidavit filed June 5, 2008, are effective to remove Mobin and Li, as well as Tzannes, from consideration, and thus to overcome the present rejection.

Claim 11 (pages 37-38 of the Answer)

Dependent claim 11 is believed to be patentable at least by virtue of its dependency from independent claim 1, which is believed to be patentable for at least the reasons identified above.

Moreover, Appellants maintain that the Declaration of Prior Invention filed December 13, 2007, and the Attorney Affidavit filed June 5, 2008, are effective to remove Li, as well as Tzannes, from consideration, and thus to overcome the present rejection.

Claim 15 (page 38 of the Answer)

Dependent claim 15 is believed to be patentable at least by virtue of its dependency from independent claim 1, which is believed patentable for at least the reasons identified above.

Furthermore, Appellants maintain that the Declaration of Prior Invention filed December 13, 2007, and the Attorney Affidavit filed June 5, 2008, are effective to remove Tzannes from consideration, and thus to overcome the present rejection.

Claims 21 and 22 (pages 38-39 of the Answer)

Dependent claims 21 and 22 are believed to be patentable at least by virtue of their dependency from independent claim 18, which is believed patentable for at least the reasons identified above.

Moreover, Appellants maintain that the Declaration of Prior Invention filed December 13, 2007, and the Attorney Affidavit filed June 5, 2008, are effective to remove Li, as well as Tzannes and Mobin, from consideration and thus to overcome the present rejection.

Claim 36 (pages 39-40 of the Answer)

Dependent claim 36 is believed to be patentable at least by virtue of its dependency from independent claim 34, which is believed patentable for at least the reasons identified above.

Furthermore, Appellants maintain that the Declaration of Prior Invention filed December 13, 2007, and the Attorney Affidavit filed June 5, 2008, are effective to remove Shurvinton, as well as Tzannes and Mobin and Li, from consideration and thus to overcome the present rejection.

In view of the foregoing, claims 1-38 are believed to be in condition for allowance, and such favorable action is respectfully solicited.

Respectfully submitted,



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